

and even territorial depending on the day of the week in question; at weekends and on public holidays it is a stronger relationship caused by leisure-generated mobility and in which the distance factor is a less decisive element when it comes to establishing relationships.

As for internal relationships, we find they are centralised on Bages and, probably, on Manresa, while the other counties in the region have very weak and sometimes non-existent relationships with one another. The lack of central axes for the whole region and the fact that various transport systems have stronger communications with other areas, especially the Regió Metropolitana, certainly have something to do with this situation.

- 1 Homeward journeys have been added to each of the main reasons.
- 2 Under these labels we find leisure/fun, going for a walk and visiting friends.
- 3 Here we find errands, visits to the doctor, unregulated education and eating other than as a leisure activity.

DAILY MOBILITY IN THE TERRES DE PONENT

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1. General daily mobility characteristics of the population

According to the data provided by the Survey of Daily Mobility (2006), during 2006 the 323,323 residents of the Terres de Ponent (Western Regional Area) made a total of 6,830,078 weekly journeys which averages out to 21.13 journeys per person per week. Although average individual mobility is very similar across the different regional areas under study, it varies in terms of concentrations of journeys.

These figures show that, in general, mobility in the Terres de Ponent is less intense than in other territories, together with the Comarques Centrals (Central Regions) and the Comarques Gironines (Girona Regions). We can see that in the Terres de Ponent the average number of journeys made on weekdays is 3.33, while on weekends the daily average falls to 2.24 journeys per person.

On weekdays the average number of journeys per person¹ is close to averages for Catalonia as a whole (3.38 per person per week), but on weekends the population of the Terres de Ponent, together with the Comarques Centrals, make the least journeys.

2. Motives for travelling

Throughout all the regional areas, figures for mobility linked to personal motives

(shopping, accompanying another person—children or elderly—, leisure, etc.) are higher than those for work or study related mobility (occupational mobility). In the Terres de Ponent, however, it should be noted that the journeys made to and from work / place of study account for 47.4% of all journeys, a percentage which is slightly higher than that recorded for other areas, and in any case significantly higher than the figure for Catalonia as a whole (45%).

So, figures for journeys undertaken for personal motives are quite moderate compared to those for other areas. Shopping (7%), leisure activities (5%) and accompanying other people (4%) are the main motives for journeys on weekdays. In the Terres de Ponent figures are considerably lower for journeys related to leisure, going for a walk or taking advantage of free time compared to other regions. Accordingly, while the average for journeys related to personal reasons (leisure, taking a walk, visiting friends or family) in Catalonia account for 32.1% of all journeys, the corresponding figure for the Terres de Ponent is only 10.8%. In contrast, however, the motives which are more relevant are: accompanying other persons, personal business, doctor/hospital and attending informal training courses (i.e. those offered in community centres etc., with no official qualification).

The significant proportion of elderly people in the Terres de Ponent, compared to the age structure in other territories, the lower level of mobility for part of the population, and the limited public transport services in the region, offer a likely explanation for the higher percentages for these motives.

In the Terres de Ponent, the reasons for making journeys at the weekend are of a more leisure-oriented nature. Leisure pursuits (which alone cover 16%), going for a walk or visiting family together, account for 34.5% of journeys made on weekends.

The significant figures for journeys home (more than 46.5%) in the Terres de Ponent, confirms the pendular nature of mobility: that is, citizens do not combine their journeys, but rather, for example, leave home to go to work and then return home; or go out shopping and then return home².

3. Use of transport modes

The evident inadequacy of public transport (lack of services and networks or the limitations of existing services) in the Terres de Ponent explains why a car is the prevalent mode of transport, accounting for 48.6% of journeys on weekdays and 59.1% on weekends. Furthermore, figures for the number of people travelling in a car are very low: 1.20 on weekdays and 1.34 on weekends.

However, journeys are also undertaken via non-motorised modes of transport with

notably higher figures than for other areas. Walking or using a bicycle in the Terres de Ponent account for 46.4% of journeys on weekdays, while figures for Catalonia as a whole are 45.1%. Walking accounts for 45% of all journeys. These are significant differential features of this area.

On weekends figures for non-motorised transport means fall to 41%, a tendency which can also be seen for public transport use, which drops from the already marginal 6% on weekdays to 2.2% on weekends.

On weekdays privately owned vehicles are the most common means for getting to and from work, while journeys for personal motives are mainly resolved via non-motorised means (on foot/by bicycle). On weekends the figures for private transport use increase significantly whatever the reason for the journey, which, as already stated, are related to longer journeys which go beyond municipal boundaries.

Journeys in the Terres de Ponent are usually undertaken by only one transport mode, single-modal. If we define a stage as each of the trip trajectories which require changing from one transport mode to another, then journey-stage relationships are 1.02 (for weekdays), and 1.01 (for weekends).

4. Journey times and concentrations

The hourly breakdown of journeys shows the rhythm and concentrations of journeys according to motives for the journey. Thus, work-related journeys (work and study) on weekdays are generally concentrated in two time zones: 7:00-10:00 a.m. and from 5:00-8:00 p.m. Rhythm and concentration, however, change outside the metropolitan area. For example, in the Terres de Ponent, a significant feature is the volume of journeys at midday (from 1:00 p.m. to 4:00 p.m.), for the main part people returning home from work or place of study. However, a further interesting aspect here is that occupational mobility (work or study) not only governs individuals' personal agendas but also those of others and how they make use of the territorial space. One example of this is the motive "accompanying another person" which, as stated earlier, is a significant feature of the Terres de Ponent. The concentrated volumes accordingly generated are mainly found in time zones related to class and work schedules (8:00-9:00 a.m. and 4:00-6:00 p.m.).

Mobility governed by personal motives, as opposed to occupational mobility, is much more even throughout the day, generating more continued use of public space. This is particularly evident on weekends when journeys are much more even and more concentrated than on work days. One of the findings of this survey has been to reveal the numbers and relative importance of personal mobility, but another important aspect that needs

to be underlined is the corresponding spatial area travelled which means a more continued use of public space.

5. Mobility according to gender and age

The different mobility patterns and motives for travelling, in the case of the Terres de Ponent, illustrate gender-related differences. While these differences are marginal for overall mobility figures on weekdays, these differences increase considerably on weekends. Figures for weekdays are 3.31 journeys for women as opposed to 3.35 for men, a slight difference which increases significantly on weekends to 2.07 and 2.41, respectively. This situation is explained by the different motives for journeys and the main transport means used by each of these social groups.

This breakdown by gender and age also illustrates that, logically, the least mobile of the population are elderly women. This comparatively lower degree of mobility is repeated throughout the different age ranges for females with the notable exception of the 30-64 age range, where there is a greater degree of mobility than for men in the same age group. This fact is clearly related to the role of women in the various types of family (motherhood related tasks and taking care of the family and home, taking the children to school and accompanying grandparents, etc.). Similarly, this can be seen when analysing the reasons behind mobility: for young and mature men (working age) mobility is mainly work related, while for women personal motives are the main cause and this is a major feature of women's mobility in the 30 to 63 age range.

The most mobile group is comprised of males between 4 and 15, who make an average of 3.66 daily journeys on weekdays. But this is closely followed by women aged between 30 and 63, who make an average of 3.63 journeys on a weekday. In addition, women in this age group combine their journeys more (multi-purpose) than the rest of the age ranges and groups.

Students and those who are actively employed are the social groups that generate greater mobility. Pensioners and those who undertake unpaid domestic work (in essence, women) are the social groups with least mobility, lower even than for figures for retired persons. The lower age groups are more mobile (occupational mobility), while from 16 onwards mobility generated by personal motives increases, and finally becomes the major motive for mobility among the elderly.

Women, youths up to the age of 16 and the elderly are the social groups who make most use of public transport. The social advantages derived from promoting this mobility behaviour is self-evident, in addition to the environmental and economic benefits derived from more

sustainable means of mobility. Two out of every three journeys in the Terres de Ponent correspond to these age groups. They account for almost half the figures for private transport use, but this figure increases to more than 75% for public transport and non-motorised means.

6. Territorial analysis of mobility flows

6.1. The importance of self-containment and mobility relationships within the area

Another feature of mobility in Catalonia is self-containment, or intra-municipal mobility (journeys within the municipality), where the major mobility flows are within the same municipality. Municipal self-containment here is understood as the percentage of intra-municipal journeys over the total journeys made in each of the territorial areas, and for Catalonia as a whole the figure is 71.3% on weekdays, falling on weekends. The Terres de l'Ebre and the Terres de Ponent have the highest indices of self-containment in Catalonia, the figure for the Terres de Ponent being 75.4%. This figure is significantly higher than the average for Catalonia and has various implications concerning time spent travelling, distances travelled and the transport modes used, as will be seen later. But it is also related to the socio-economic characteristics of this territory: the distribution of the population and where jobs are located. On the one hand, generally speaking the predominance of agriculture in the Terres de Ponent tends to establish very short distances between the home and the work place, explaining the high levels of self-containment. On the other hand, other significant reasons behind this high level of self-containment are likely the concentration of services and work places, generally speaking in region capitals. The data also reflects the high degree of self-containment generated by the capital city Lleida, and, in contrast, the limited capacity of other capitals and urban nuclei in neighbouring regions to generate self-containment.

On weekends, however, inter-municipal journeys, although less significant numerically, mean travelling longer distances producing what we could call "crossover mobility": a higher level of mobility on work days but which involves much shorter distances compared to Catalonia as a whole, while on weekends fewer journeys but which involve covering longer distances (inter-municipal).

The relationship between journeys made within the same municipality over total journeys gives us a measurement for self-containment. These figures confirm this idea of crossover mobility. Self-containment in the Terres de Ponent on weekdays is 75.4%, compared to 71.3% for Catalonia as a whole, while on Saturdays and Sundays this figure falls to 64.4%, slightly above the average for Catalonia (64.2%).

The largest number of inter-county journeys is between Segrià and Noguera, followed by Segrià-Pla d'Urgell, for both weekdays and weekends. Other inter-county figures are of minor importance.

6.2. The territorial scope of journeys between different areas

The relationship revealed by journeys between the Terres de Ponent and the Regió Metropolitana de Barcelona is far less concentrated than those established between the metropolis and other regions, especially the most immediate: Comarques Gironines, Comarques Centrals and the Camp de Tarragona. The figures for the Terres de Ponent and the Regió Metropolitana de Barcelona, some 20,000 on weekdays in both directions, are one fifth of the averages recorded for nearby regions. This ranking with the metropolis is close to that for the Terres de l'Ebre and the Alt Pirineu i Aran, which are the furthest from the metropolis and the most inland areas in Catalonia.

In contrast, another feature which needs to be underlined is the significant number of journeys from the Terres de Ponent running outside Catalonia, some 7,000 on weekdays. This figure is comparable to the number of journeys between the Terres de Ponent and the Alt Pirineu, but double that with the Terres de l'Ebre.

One possible explanation for this high number of people travelling outside Catalonia on a daily basis is the frontier position of the Terres de Ponent and the strong traditional links with the Aragonese strip. In fact a noteworthy feature is that figures for travelling outside Catalonia from the Terres de Ponent are significantly higher than for the rest of Catalonia on weekends, double those for weekdays.

As already stated in section 2, the bearing of occupational mobility on weekdays is more important compared to figures for other regions, although personal mobility continues to be the dominant factor. Mobility for personal motives becomes more important with regard to internal flows; that is, within the Terres de Ponent and curiously accounts for an important part of the mobility flows with the metropolis Barcelona. There is a clear functional relationship between motives for travelling between Terres de Ponent and the metropolitan areas which combine occupational journeys with other journeys for personal motives, to the degree that the percentage returning home for personal motives is significantly higher than the out-going occupational journeys.

In contrast, also on weekdays the mobility relationships between the Terres de Ponent, Comarques Gironines and the Camp de Tarragona are more work-related, all in all accounting for more than 55% of all journeys. The same can be said for mobility relationships extending beyond Catalonia.

6.3. Distribution by transport mode of internal and inter-county journeys

74.8% of all journeys made by the Terres de Ponent population on weekdays and 64.2% on weekends begin and end in the same region. The region with the highest level of self-containment is Segrià, for both weekdays as well as weekends. In contrast, the region with the lowest level of self-containment is the Pla d'Urgell which establishes a good number of mobility links with neighbouring regions, especially Urgell and Segrià.

As mentioned earlier in section 3, the Terres de Ponent generates a significant degree of ambivalence regarding the mode of transport used for undertaking journeys: on the one hand, non-motorised modes represent a significant percentage, yet on the other hand one can see a parallel importance in the use of a privately-owned vehicle. Non-motorised forms of transport take on a leading role in intra-municipal and short-distance journeys (47.9%). Use of public transport is close to negligible, especially within this area; however, public transport takes on a major role in inter-county journeys and long distance trips. For example, in the case of mobility relationships with the Regió Metropolitana de Barcelona use of public transport accounts for 23% all journeys between these two areas. There is also a significant use of public transport in mobility flows with the Comarques Gironines (almost 15%) and Camp de Tarragona (12%). The reason behind these two cases is the very good current public transport service. In contrast, there is far less use of public transport linking the Comarques Centrals, the Alt Pirineu i Aran and for travelling outside Catalonia.

7. The subjective dimension of mobility

7.1. General characteristics

41.3% of those living in Terres de Ponent do not have a driving licence. This figure is particularly significant and has further social implications when one recalls that this area does not have an efficient public transport system.

7.2. Evaluation of the modes of transport

Evaluations of mobility in the Terres de Ponent need to be seen in the light of its territorial context and, as we have already seen, the use of private transport by the majority, although this needs to be weighed against the shortcomings or lack of public transport services. Bearing this in mind will help in understanding the following evaluations:

- a. Private transport: Reasons for using private transport are more wide-ranging in Catalonia than in the Terres de Ponent, although one significant feature is that

the reasons given and ranking are not the same. In the Terres de Ponent the main reasons, bearing in mind the starting premise here, relate to the lack of public transport or the shortcomings of the present inadequate service. In more specific terms, reasons given were: there is no public transport alternative (5.99), comfort and convenience of private transport (5.63), or the time-saving factor in journeys (5.62), being those which rated highest. But for Catalonia as a whole the reasons are quite different: the time-saving factor in journeys (5.96) ranks first; there is no public transport alternative (5.81) second; followed by the need to make trips for various motives consecutively (5.74). It should be noted that the comfort criterion, which is cited in the case of the Terres de Ponent, does not even figure in the responses from the rest of Catalonia. Comfort is a particularly important consideration in the Terres de Ponent when one allows for the more continental climatic conditions and the shortcomings of the inter-urban public transport.

- b. As regards evaluating public transport, the main differences for Catalonia are "difficulty finding parking or traffic congestion", rated first with a score of 5.89%, which in contrast is rated third in the Terres de Ponent. Another significant finding is that in Terres de Ponent hardly any consideration is given to "shorter travel time", rated lowest. This is no doubt closely linked to "accessible stops / stations in terms of distance". For Catalonia "shorter travel time" rates third (5.33); while in the Terres de Ponent this rates last (3.99), a difference of almost two points. Another point that should be noted is the distances covered by the public transport networks: almost non-existent in the majority of the municipalities because there are less than 20,000 inhabitants, and where they do exist they are inter-urban services with very long distances between stops. The fact remains that the lack of appropriate distances between stops and reliability / running on time are the main reasons for the low scores obtained concerning public transport in Terres de Ponent, rated 4.97 and 4.87% respectively.
- c. So, the evaluations of private and public transport are not simply related but have crossover conditioning factors. By way of a general and comparative view between these two transport modes, it should be noted that maximum and minimum scores for motives for using public transport (not forgetting its minor role in the Terres de Ponent), oscillate between only one point. This is a clear evaluation which we could call "compact" and in keeping with the shortcomings of public transport services mentioned earlier. For the rest of Catalonia this differential value increases to two points. This is also coherent with a correspondingly better

public transport services. But we must also point out that, in contrast, the evaluations in favour of using private transport are more wide-ranging and fluctuate between 6 and 2.36, that is, more than 3 points. It is as if having no alternative than a car generates less consensus of reasons given compared to the more "compact" range of reasons in the case of evaluating public transport. Consequently, one possible conclusion that we can draw here is that public transport services have a clear idea of the path they need to follow and the improvements they need to make.

8. Declared mobility-related expenses

The monthly expenses declared by users of different transport means for Catalonia as a whole is 473.7 million euros, which breaks down into 108.2 million euros on public transport and 365.5 million euros on private transport. This means that the average monthly travel costs declared by users is 25 euros on public transport and more than 100 euros on private transport. It should be noted that these costs are calculated over the user population of this transport means and therefore is a ratio between total expenses and the user population and not a simple addition of the different entries.

In the Terres de Ponent declared average month travel expenses are 18.65 euros on public transport, a figure which rises to 91.84 euros for private transport. As can be seen, this imbalance once again illustrates the types of mobility and transport modes used in different areas. It is also clear that the functional areas of Catalonia, where monthly outlay on public transport is lowest, are Terres de Ponent and Terres de l'Ebre, areas where public transport services are either non-existent or inadequate.

9. Some points for consideration concerning the data from the survey of daily mobility in the Terres de Ponent

Differential mobilities for cities and town in Terres de Ponent

As is the case for Catalonia as a whole, the personal mobility profile is quite different from the occupational mobility profile. The latter is determined by the mobility flows of workers and students. Occupational mobility has two peaks during the day: the highest of the two being in the morning, and the other, almost half, in the afternoon. However, we could say that personal mobility is much more "even", that it is "slower" and, above all, we could also say that it involves more "time", to which we can surely add that it covers a wider spatial area in our towns and cities. What this means is that less tension is generated throughout the urban stretch compared to occupational mobility flows, with lower

costs in terms of congestion and the effects of tense traffic conditions such as accidents and stress. In addition, this mobility is continual, steady and extends over longer periods of time (graphically illustrated by two gentle curves) and translates as more presence on the streets and a greater degree of safety in public spaces. It should be noted that the occupational mobility group is smaller. Revealing this more daily and calm form of mobility which has less impact than occupational mobility, is one of the lessons learned from this survey, and offers a whole range of clues as to mobility policies in Catalan cities linked to managing time in the city / territory.

The strong presence of private transport. A significant feature of this survey is that the data reveals the low level use of public transport in the functional areas of the Terres de Ponent. This deficit corresponds to the area of public transport networks and services, which is also related to the population layout of the territory and the lack of larger urban nuclei.

Another question illustrated by this survey is the major importance of non-motorised mobility, even in worker or student itineraries, and a significantly higher use of bicycles than in the rest of Catalonia. Although their numbers are small compared to total mobility figures, they differ significantly from Catalonia as a whole and are a significant feature in the Terres de Ponent. This form of mobility, in numbers a little lower than for the rest of Catalonia, is concentrated but “shorter” on weekdays and implies longer distances on weekends. It is as if the strong presence of non-motorised proximity mobility, evident on weekdays, either walking or using a bicycle, is juxtaposed against longer distance mobility on weekends. We must once again insist on the fact that the lack of an extensive general public transport system in the functional area of the Terres de Ponent, shapes its mobility. Along these lines we would like to cite by way of an example of good mobility practice, the creation of the Consorci del Transport Públic de Lleida (Lleida Public Transport Consortium), set up between the DPTOP of the Generalitat de Catalunya (Catalan Autonomous Government) and the town councils in the Lleida area, which has provided solutions to some of the mobility problems discussed earlier and provides a measure of cohesion in the space/time mobility of the citizens living in and around the city of Lleida. This Consortium is an exemplary instrument for improving public transport mobility in the functional areas of the Terres de Ponent.

1 These figures applicable to 95.8% of the journeys made by those who do not drive as an integral part of their job (i.e. lorry drivers, taxi drivers, public transport drivers, etc.), given that those who do represent 4.2% of the journeys in the Terres de Ponent who make an average of 16.43 journeys per day.

2 This relationship of combining journeys, one of them being returning home from a journey motivated by personal reasons, is a very relevant feature in the comparative relationships between the Regió Metropolitana de Barcelona and the Terres de Ponent, as is explained later on.

DAILY MOBILITY IN ALT PIRINEU I ARAN

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Introduction

Alt Pirineu i Aran show some extreme characteristics compared to the other Catalan regions. Covering 5,775.6 km², it represents 17.99% of the area of Catalonia, while the population of 69,325 inhabitants of Alt Pirineu i Aran, in 2006, corresponds to only 1.01% of the total for the country. When it comes to the subject of mobility, this situation establishes a strong contrast between a very extensive mountainous region and a population that is dispersed throughout it but at the same time concentrated in small towns and villages along the main valleys and the communication routes that run along them. The volume of weekly journeys (1.8 million), although small in absolute terms, is more than 15% higher than it would be if it corresponded to the region's total population compared to Catalonia as a whole. The situation is the same with the number of journeys per person per week. The average for Catalonia is 22.62 journeys pers./week, while in Alt Pirineu i Aran it rises to 25.45 (23.70/21.64 without mobility professionals), representing 12.5% more.

We therefore find a very extensive territorial area with low population density (12 in./km²) where settlement is concentrated on the county capitals and larger towns and villages. Of the 77 municipalities in the region, in 2006 only one had more than 10,000 in. (la Seu d'Urgell, 12,533 in.) representing 18.08% of the total, and three had between 5 and 10 thousand inhabitants, containing 28.13% of the population. There are 3 municipalities of 2 to 5 thousand (10.98%), 8 of 1 to 2 thousand (16.73 %) and 10 of 500 to 1,000 in. (11.43 %). These 25 municipalities of more than 500 in., with a total of 59,154 in., together currently represent 85.33% of the total population. The trend towards the concentration of the population has particularly increased since the second half of the 20th century. So, 50 years ago, the 25 municipalities with more than 500 inhabitants in Alt Pirineu i Aran —without the aggregations of the decade 1970-79— represented 50% of the population (Tulla, 1993). In the same way, the 52 municipalities with less than 500 in. currently only concentrate 14.67% of the total population. We can see the distribution on figure 1.

So, in this part of the Pyrenees we find some very large municipalities, as is the case of Tremp (302.8 km²), and other very small ones, such as la Seu d'Urgell (15.4 km²). Given this territorial diversity it is difficult to establish comparisons. Considering everything, two general characteristics must be taken into account in these mountainous areas with very closed valleys: (a) regardless of whether the municipal area is very large, almost all the population is concentrated into the main centre, and (b) when the municipality is very small, part of the population of contiguous municipalities is located on the edge of the more populated municipality. These facts corroborate the concentrated structure of the population in the main valleys.

1. Daily mobility in Alt Pirineu i Aran within Catalonia

Mobility in Alt Pirineu i Aran is the highest, in a relative sense, of any of the seven regions of Catalonia, together with Camp de Tarragona, despite the high rate of aging of the population and the fact that the activity rate is one of the lowest in Catalonia. Although the population of Alt Pirineu i Aran represents only 1.01% of Catalonia, it accounts for 1.11% of the daily mobility —1.08% on working days and 1.19% at weekends and on public holidays. This means the percentage of journeys in relation to the total for Catalonia is 9% higher than would correspond to its percentage of the population.

The activity rate in 2001 in Alt Pirineu i Aran was only 55.71%, while in Catalonia it was 58.38%. However, in 2006 the unemployment rate was 8.32% in Catalonia and only 4.44% in Alt Pirineu i Aran. The female activity rate for the same year in Alt Pirineu i Aran was 45.68% and in Catalonia 48.33%. The population aged over 65 in Catalonia in 2005 was 16.57%, while in Alt Pirineu i Aran it rises to 19.49%. The female population aged over 65 in Catalonia in the same year, compared to the entire female population, increases to 19.04% but is still higher in Alt Pirineu i Aran, with 21.98%.

The *percentage of intra-municipal journeys (self-containment)* in Alt Pirineu i Aran (73.5%) is slightly greater than the average for Catalonia (71.3%), both on working days and at weekends/on public holidays (70.4% and 64.2% respectively). This greater self-containment in Alt Pirineu i Aran is explained by the strong concentration of the population into few municipalities, which, in turn, determines lower average times for intra-municipal journeys in Alt Pirineu i Aran compared to the average times for intra-municipal journeys in Catalonia as a whole, both on working days (11.94 and 15 minutes respectively) and at weekends and on public holidays (16.60 and 17.87 minutes). By contrast, the times for inter-municipal